

## ABSTRACT OF THE INVENTION

An apparatus for fabricating a soot preform for an optical fiber. The soot preform is fabricated by depositing glass particles on a starting rod capable of being rotated and pulled up. The apparatus comprises elements as follows. A reaction chamber is used  
5 for depositing the glass particles on the starting rod. An upper room is located above the reaction chamber for receiving the soot preform formed in the upper portion of the reaction chamber. At least one core burner is installed in the reaction chamber. A gas-supplying inlet is located in the top part of the sidewall of the reaction chamber closest to burner(s), and a gas-exhausting outlet is located in the top part of another  
10 sidewall opposite to the gas-supplying inlet. In addition, at least one cladding burner is installed in the reaction chamber. Thus, the exhausting efficiency for the stray glass particles is increased and the bubbles and impurities in the resulting preform are reduced such that the optical property in the lengthwise direction is stable.